NOTE XLIV.

THE GENERA OF EUROPEAN NEMERTEANS CRITICALLY REVISED, WITH DESCRIPTION OF SEVERAL NEW SPECIES.

BY

Dr. A. A. W. HUBRECHT.

During a stay at Naples in the past winter, I became acquainted with a great number of *Nemertini* which had escaped my notice on a former occasion (1874), and of which I could have numerous specimens in different varieties thanks to the greatly improved methods of dredging and searching which are now practised in Prof. Dohrn's splendid establishment.

This enabled me to gain a better insight, not only in the anatomy of the group, but in the range of varieties, species and genera as well. The preliminary results of these researches are contained in the following pages.

The number of genera, which at present have been introduced into zoological literature to designate Nemerteans belonging to the European fauna amounts to forty-eight. The following is a list of their names, authors and dates:

Planaria (Linn.) O. F. Müller . .	1773.
Fasciola, » »	»
Gordius, » »	»
Cerebratulus, Renier	1804.
Tubulanus, »	»
Lineus, Sowerby	1805.
Acicula, Renier	1807.
Borlasia, Oken	1817.

Nemertes, Cuvier.	1817.
Polia, delle Chiaje	1825.
Meckelia, Leuckart	1827.
Prostoma, Dugès	1828.
Lobilabrum, de Blainville	»
Ophiocephalus, »	»
Siphonenteron, Renier	»
Notospermus, Huschke	1830.
Polystemma, Ehrenberg.	1831.
Micrura, »	»
Tetrastemma, »	»
Amphiporus, »	»
Hemicyclia »	»
Ommatoplea, »	»
Notogymnus, »	»
Carinella, Johnston	1833.
Ramphogordius, Rathke.	1843.
Chloraima, Kölliker	1844.
Cephalotrix, Oersted.	»
Astemma, »	»
Akrostomum, Grube	1845.
Serpentaria, Goodsir.	»
Valencinia, de Quatrefages. . . .	1846.
Oerstedia, „	»
Pylidium, J. Müller.	1847.
Scotia, Leuckart	1849.
Baseodiscus, Diesing.	1850.
Alardus, Busch	1851.
Vermiculus, Dalyell	1853.
Cosmocephala, Stimpson	1854.
Cnidon, Joh. Müller.	»
Loxorrhochma, Schmarda	1859.
Quatrefagea, Diesing.	1862.
Ptychodes, »	»
Ototyphlonemertes, Diesing	»
Otoloxorrhochma, »	»
Ditactorrhochma, »	»

Prosorhochmus, Keferstein . . . . . 1868.
Drepanophorus, Hubrecht . . . . . 1874.
Avenardia, Giard . . . . . 1878.

It is clear that for an order of worms, which is yet so imperfectly known as the Nemerteans, this extraordinary large number of genera must contain many synonyms. Authors who failed to find well marked characters, by which to distinguish the species of these worms (which moreover showed such a protean variability in their external appearance) highly overvalued any small structural difference which happened to be common to two or more species and immediately founded a generic division on so insufficient a basis. The short and incomplete description of many of the genera was further one of the causes which led to unnecessary multiplication of their number, whereas the fact that in many cases no account whatever was taken of the internal anatomical characters, when establishing a new genus, gave rise to a considerable confusion, which it will be difficult to get rid of gradually.

If we take the three naturalists, whose researches have most contributed to our knowledge of the *Nemertini* in the last thirty years: Quatrefages, Keferstein and Mac-Intosh we find different genera adopted by each of them and — what is more embarassing yet — a different scope given to the same generical name, in consequence of which Keferstein for instance employs the name *Borlasia* for worms belonging to the great subdivision of armed Nemerteans, whereas Mac-Intosh, more strictly adhering to Okens original intention, applies it to an unarmed species.

Quatrefages who examined atlantic as well as mediterranean forms (Annales des Sciences Naturelles Vol. VI 1846) admits the six genera *Valencinia*, *Borlasia*, *Nemertes*, *Polia*, *Cerebratulus* and *Oerstedia*. Keferstein (Zeitschr. f. Wiss. Zoologie, Bd. XII) adopts M. Schulze's suborders of armed (Nemertinea enopla) and unarmed Nemerteans (Nemertinea anopla) and establishes three families on charac-

ters taken from the cephalic fissures. One family (the Tremacephalidae) contains all the Nemertinea enopla, arranged in the genera *Polia*, *Borlasia*, *Oerstedia*, *Micrura*, *Prosorhochmus* and *Lobilabrum*. His two other families: the Gymnocephalidae and Rhochmocephalidae both belong to the Nemertinea anopla. The former contains only one genus: *Cephalotrix*, the latter four: *Lineus*, *Cerebratulus*, *Nemertes* and *Ophiocephalus*. Total eleven genera. The number of species which he examined was much less than those which Quatrefages disposed of. He largely contributed to our knowledge of the anatomy of the group but I do not think his systematic arrangement was a very successful one, although it has found its way into numerous textbooks. So for instance he does not seem to have noticed that four of his six genera of armed Nemerteans were established by their authors for unarmed species (*Polia*, *Borlasia*, *Micrura*, *Lobilabrum*). Quatrefages had commenced to create a confusion by applying those generic names in a wrong sense; still Keferstein might have corrected the error instead of extending it.

Mac-Intosh (Ray Society Publicat. 1873, '74) who has limited his researches to the British Nemerteans (of which he describes 31 species) has distributed them in twelve genera, four of which (*Amphiporus Tetrastemma*, *Prosorhochmus* and *Nemertes*) belong to the family of the Amphiporidae, five (*Lineus*, *Borlasia*, *Cerebratulus*, *Micrura*, *Meckelia*) to the family Lineidae, two (*Carinella*, *Valencinia*) to the family Carinellidae, whereas the genus *Cephalotrix* forms by itself the family of Cephalotricidae. The first family again coincides with the suborder of Nemertinea enopla, the three last with that of the Anopla. It is a pity that before fixing upon his final arrangement, which must be recognized as a most decided advance upon his predecessors, the author had no occasion personally to examine the principal mediterranean species, which might have induced him to a reduction in the number of his genera as will presently be proposed. His families are very well chosen; here at

last the internal structure of these worms, which externally present so little difference, is taken into consideration and an arrangement into more natural groups is the immediate result.

If we apply the rule that generic names may not stand when applied in a sense different from what they were intended for by their author (as may be judged from the species on which he primitively established the genus: the type species, or typical specimens), three of Quatrefages' genera (*Polia*, *Borlasia*, *Cerebratulus*) must be cancelled and his species divided over other genera to which they more properly belong. To Keferstein's *Polia* and *Borlasia* the same rule should be applied, as well as to Mac-Intosh's *Meckelia*. Rigidly speaking the name *Nemertes* Cuv. was applied to a worm quite different from those which later authors united under that name. However not only Quatrefages and Mac Intosh but Kölliker (Verh. Schweiz. Naturf. Gesellsch. Chur 1844) and many others have all applied the name *Nemertes* to armed species and so here we may feel justified in maintaining it in this modified sense. Then of course the species to which Keferstein and v. Beneden applied this name must reappear in another genus. And if we separate Keferstein's genus *Micrura* from the Tremacephalidae, again placing it amongst the Anopla we have only the genera *Ophiocephalus* and *Lobilabrum* to account for in order to bring the arrangements of Keferstein and Mac Intosh in accordance. Now *Ophiocephalus* was established by Blainville for a worm brought by Quoy and Gaimard from their voyage of circumnavigation and had it not been brought from Sydney Blainville himself would not have hesitated in placing this species in the genus *Cerebratulus*. Such at least may be understood from his text (Dict. des Sciences Nat. Paris 1828. Vol. 57). Delle Chiaje further discredited this generic name by employing it in 1829 (Descr. e Not degli Anim. invertebr. etc. Vol. III, p. 127) for three species very heterogenous among themselves and of which we will have occasion to speak

further on. So we are amply justified in proposing the suppression of this name.

Lobilabrum de Blainville must be cancelled too. Here however we must motive our judgment more circumstantially, as this genus, which was established by Blainville on one specimen of a species (*Lobilabrum ostrearum*) never since met with by any other naturalist, is remarkable for the very striking characters by which it can immediately be distinguished from other genera. These characters are: a blunt snout with two horizontal lips at the extremity, both of them bilobed and apparently tentaculated. The slit between the lips is at the same time a continuation of the lateral fissures on both sides of the head. In all other respects there is a very strong resemblance to species of *Lineus* or *Cerebratulus* living in the same localities. One day in Naples I was fortunate enough to get a second specimen of this rare genus which, like Blainville's specimen, was collected from a bottom covered with bivalve shells. It was duly figured and preserved and longitudinal sections were made of the curious snout. Soon after I was struck by the extraordinary resemblance in habitat which existed between another Nemertean (whose anterior extremity exactly answered to that of a *Lineus* or a *Cerebratulus* and carried two well pronounced lateral fissures) and this single specimen of *Lobilabrum*. Once my doubts raised I pursued the investigation by purposely cutting off the tip of the snout in one of the last mentioned specimens in a direction vertical to the body axis. Immediately the curious arrangement of the lobed and tentaculated lips which had hitherto been limited to the genus *Lobilabrum* appeared, the animal lived comfortably for several weeks and afterwards longitudinal sections showed that an epidermoidal covering had made its appearance identical with what had been found in the *Lobilabrum* specimen. Connecting these results with the fact of their living amongst bivalve shells I concluded that the genus *Lobilabrum* was established on a specimen the tip of whose snout had been

abnormally severed by an oyster, into the opened shell of which it was stealthily trying to penetrate. The extreme rarity of the species was a corroberating evidence. On these grounds I propose to cancel the generic name of *Lobilabrum*, the type [1]) of which probably belonged to one of the species of Atlantic Lineidae.

The remaining genera mentioned by these three prominent authors (even when a few of them may presently be shown to be synonymous, and their number therefore liable to further reduction) must form the nucleus for any further proposal for the systematic arrangement of the order. Before developing my own views on this head I have still to account for several of the genera which are contained in the list on page 194. *Planaria* and *Gordius* have come to be used for different types of worms and the Nemerteans described under these generic names must be distributed under the head of *Cerebratulus* and *Lineus*. *Tubulanus* will be shown to be identical with *Carinella*; *Meckelia* was used for the same worm which had served as the type to Renier's *Cerebratulus marginatus*, so was *Serpentaria* and both of them must be again substituted by the name which has the indisputed claims of priority. Mac Intosh applied the name *Meckelia* to quite a different animal which seems to be misplaced among the Lineidae and may prove to be more closely related to the Cephalotricidae or Valenciniaidae, at all events to belong to the suborder of Palaeonemertini (vide p. 206). *Notospermus* and *Notogymnus* were established upon an unmistakable *Cerebratulus* as Quatrefages has long ago shown. *Siphonenteron* and *Vermiculus* have never been well characterized; the former was moreover synonymous with another genus of the same author from the beginning, and so both have been abandoned. Then again *Astemma* and *Cephalotrix* are synonyms and with Mac Intosh we propose to retain only the latter

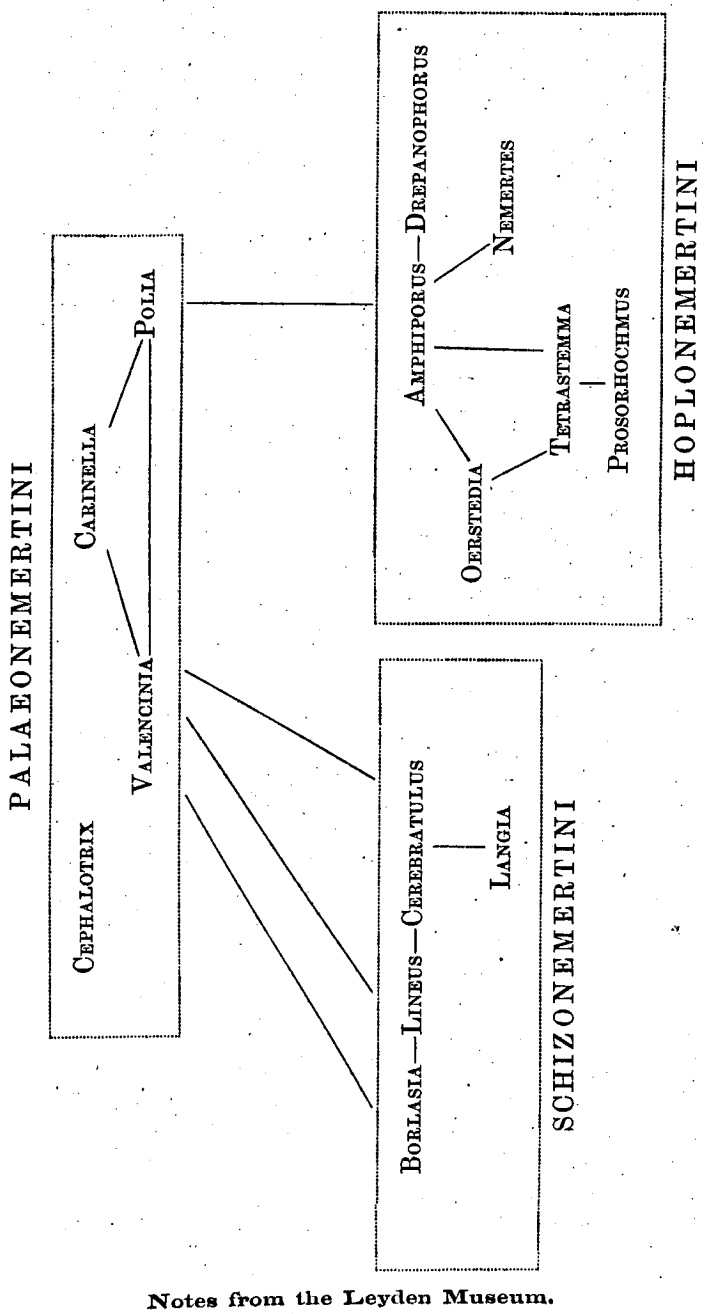
1) I inquired for the type specimen at the Museum in the Jardin des Plantes; however is was not to be found, and probably has never reached Paris.

name. *Hemicyclia*, *Polystemma*, *Ommatoplea* and *Chloraima* have again made room for generic names with undisputed claims to priority; *Cnidon* was used for a true *Cerebratulus* as will be shown hereafter, *Alardus* and *Pylidium* were only very young stages of a species of Lineidae. The american genus *Cosmocephala* was only lately introduced into the European fauna by O. F. Jensen (Turbellaria ad littor. Norvegiae. Bergen 1878) and applied to a worm which was probably a true *Amphiporus*. As to *Rhamphogordius*, *Acicula* and *Scotia* it is very questionable whether the animals described under these names were Nemerteans.

Akrostomum may possibly apply to a division of armed species; *Baseodiscus* was founded on a mutilated specimen of *Polia delineata; Ditactorhochma*, *Quatrefagea*, *Ptychodes*, *Loxorrhochma*, *Ototyphlonemertes*, *Otoloxorrhochma* and *Avenardia* were names with which Diesing, Schmarda and Giard unnecessarily burdened the synonymy of the group.

The table on page 201 is intended to show at a glance the general conclusions which I have come to respecting the degrees of affinity existing between the different genera.

Carinella Johnst. must without doubt be regarded as a form which in its structure has retained more primitive characters than any of the others: its central nervous system lies immediately under the skin, its two longitudinal lateral nerves are nowhere found enclosed by the muscular tissue of the body-wall but always *exterior* to this. This situation of the nerve-tissue which is ontogenetically a product of the epiblast reveals a more primitive condition. So does the intestine and so does the proboscis. The first is not yet provided with those numerous and regularly placed coeca which in the more developed forms branch off right and left throughout the whole length of the animal, with the exception of the oesophageal region. In *Carinella* a simple intestinal canal is present in the tail as well as in all the other body regions. The proboscis is thin and slender, only very rarely extruded and provided in its anterior part with urticating organs. A constricted part



Notes from the Leyden Museum.

about six times as long as wide separates the anterior and posterior region of the proboscis. The same constriction — however of a different character — is found in *Valencinia* and *Polia*, it has disappeared in the Lineidae, whereas in the armed species is has become more strongly differentiated and is represented by the muscular bulb in the proboscis which contains the stylet and the styliferous vesicles.

The interior of the proboscis appears to be divided into compartments by numerous transverse, thin, ring-shaped ridges which seem to offer different aspects in the three suborders proposed above. Whereas in the Schizonemertini they are visible throughout the whole length of the proboscis at equal and comparatively short distances, they make their appearance in the Palaeonemertini only in the anterior part, which it situated before the above mentioned constriction. In the suborder of the Hoplonemertini they seem to have disappeared altogether. Both here and in the Palaeonemertini there is a characteristic granular appearance in the posterior half of the proboscis behind the constriction, which is again absent in the Schizonemertini, where the segmented character of the anterior part in uninterruptedly maintained throughout the whole length of the organ.

A posterior lobe of the cerebral ganglion communicating by a ciliated duct with the exterior could not yet be detected in *Carinella* or in *Cephalotrix*; it is however present in *Valencinia* and *Polia* and in both very intimately connected with the anterior lobes. In both these genera the exterior opening of the ciliated canal is small, but whereas in *Polia* a transverse groove in the epiderm with numerous smaller grooves perpendicular to the first and all strongly ciliated seem to lead to this opening, such complications are absent in *Valencinia*. They are again met with in the armed genera *Amphiporus* and *Drepanophorus* where they exactly resemble those of the unarmed *Polia*. Here however the posterior lobes have become more detached from the ganglion, only communicating with it

by fibrous commissures. Vestiges of a simple transverse groove on a level with the cerebral ganglion are present in *Carinella* as well, although, as mentioned above, no ciliated canal leading to the nerve-ganglion could be detected in that genus. In *Cephalothrix* the groove too seems to be absent. In the four other genera of unarmed Nemerteans: *Lineus* Sowerby, *Borlasia* Oken, *Cerebratulus* Renier and *Langia* mihi, the simple external opening which was present in *Valencinia* is represented by deep lateral fissures on both sides of the head, situated in the plane of the body-axis. The simple opening has here widened out into these fissures which can be opened and shut at will by the arrangement of the muscles of the head and which are covered internally by a thick coating of very long vibratile cilia. All the four genera are further concordant in the deep red tinge of their nervous system, which is due to haemoglobine contained in this tissue. On the whole they form a very natural suborder. In the genus *Cerebratulus* I propose to include all the species described under the generic name *Micrura* by Ehrenberg and afterwards by Mac Intosh. I could not detect anatomical differences and the sole exterior difference: the very small caudal appendage, seems to appear under certain circumstances in true Cerebratuli as well and may hardly rank as a generic character. Urticating elements, which have been found in the proboscis of *Carinella* and *Cephalothrix* are absent in *Polia*, *Valencinia* and all the Hoplonemertini; they reappear in numerous species of Schizonemertini where they may even attain considerable dimensions. The six genera of armed Nemerteans form a subdivision not less natural; five of them seldom attain to a length which can be called considerable in relation to their width: the genus *Nemertes*, however, contains worms which are often extremely long and threadlike. These two subdivisions may rank as so many sub-orders, whereas the more primitive forms of Nemerteans, showing characters out of which those of both these subdivisions might have gradually

developed should rank as a third suborder. I hold this to be more in accordance with the real affinities than the subdivision in the two suborders of the Anopla and Enopla, as proposed by Max Schulze. And so the classification of the European genera which I propose is the following.

Ordo NEMERTINI.

I. Subordo PALAEONEMERTINI.

Familia *Cephalotricidae.*
Genus Cephalotrix.

„ *Carinellidae.*
Genus Carinella.

„ *Valenciniaidae.*
Genus Valencinia.

„ *Poliaidae.*
Genus Polia.

II. Subordo. SCHIZONEMERTINI.

Familia *Lineidae.*
Genus Lineus.
Borlasia.
Cerebratulus.

„ *Langiaidae.*
Genus Langia.

III. Subordo. HOPLONEMERTINI.

Familia *Amphiporidae.*
Genus Amphiporus.
Drepanophorus.

„ *Tetrastemmidae.*
Genus Tetrastemma.
Oerstedia.
Prosorhochmus.

„ *Nemertidae.*
Genus Nemertes.

The following table, analytically arranged, may be of use in determining the genus of a given specimen:

NEMERTINI

- Mouth before the ganglia; proboscis furnished with stylets; body (HOPLONEMERTINI)
  - very long and slender, often coiled together in knots; proboscis rather short . . . . . *Nemertes.*
  - more or less short and bulky; proboscis long; head
    - with four
      - large eyes, body short and stout . . . *Oerstedia.*
      - small eyes, body more slender, very contractile
        - viviparous *Prosorhochmus.*
        - oviparous *Tetrastemma.*
    - with numerous eyes,
      - with one central stylet in the proboscis *Amphiporus.*
      - with a curved hook in the proboscis provided with numerous small stylets *Drepanophorus.*
- no stylets in the proboscis; mouth behind the ganglia
  - a deep lateral fissure on both sides of the head (SCHIZONEMERTINI)
    - body flat or rounded
      - body-margins bent upwards, the frilled edges nearly meeting . . . *Langia.*
      - not so very long in comparison to its width; eyes rarely numerous, generally absent, proboscis
        - well developed, furnished with urticating organs *Cerebratulus.*
        - attenuated, muscles of bodywall very strongly tinged with red *Borlasia.*
      - extremely long; eyes very numerous . . . . . *Lineus.*
  - no deep lateral fissures on the head (PALAEONEMERTINI)
    - posterior lobes of the ganglion present, coalesced with the supero-anterior lobe;
      - no eyes, opening for the proboscis distant from the tip of the snout *Valencinia.*
      - eyes, opening for the proboscis terminal *Polia.*
    - no visible posterior lobe to the ganglia
      - head pointed, continuous with the body *Cephalotrix.*
      - head distinct from the body, spathuliform *Carinella.*

We now pass to the description of the species found at Naples. Only a short notice will be given of those which have been already satisfactorily described by Mac Intosh or

other authors, whereas the new species and those which have been confounded with others will be described more circumstantially. The exact and detailed synonymy of each species cannot as yet be given in full. For several of the species which are about to be mentioned, Mac Intosh's elaborate monograph gives a list of synonyms to which I may be allowed provisionally to refer.

Subordo I. PALAEONEMERTINI mihi.

No deep lateral fissure on the side of the head. No stylet in the proboscis. Mouth behind the ganglia.

Familia *Cephalotricidae* Mac Intosh.

The dorsal commissure of the ganglion in front of the ventral one. Lateral nerves placed between the longitudinal muscular coat and an isolated inner band of fibres. The proboscis has three coats.

Genus *Cephalotrix* Oersted. Head pointed, continuous with the body. No posterior respiratory lobe to the ganglion, nor ciliated duct leading to the exterior.

1. *Cephalotrix linearis* (J. Rathke) Oersted.

Synon. Cephalotrix bioculata Oersted.
" coeca "
" occellata Keferstein.
" longissima "
" filiformis Mac Intosh.
Astemma rufifrons Oersted.

To this species I refer a small number of specimens from the bay of Naples with about 20—30 very small eyes quite close to the body margin. The intestine was not provided with coeca. Laterally about on the same level with the mouth and with the hindermost eye-speck a very small opening was noticed (of the watervascular system?). Brown pigment was present on the tip of the snout; the animals were whitish and measured up to 5 mm.

2. *Cephalotrix signatus* n. sp.

This species immediately strikes us by its curious coloration as well or by the disposition of the eyes. The belly is white, the back of a uniform yellow. On the head the pigment takes the form of two club-like horns, longitudinal and parallel, with a white median streak between them and united at their base by a short yellow transverse bar. Two identical club-shaped yellow blotches appear on the ventral side of the head. The small eyes (30—40) are placed on a row along the margin of the head; near the tip of the snout there are two patches of eyes, each containing about four or five. The proboscis is provided with urticating elements. Length 15 mm.

Family *Carinellidae* Mac Intosh (sens. strict.).

Lateral nerves situated to the exterior of the muscular coat of the body-wall, which is composed of two layers.

Genus *Carinella* Johnston. Snout wider than the rest of the body, bluntly rounded in front, spathulate. A transverse groove in the epidermis situated in the same level with the ganglion, no ciliated duct in connection with this groove. Intestine without coeca.

3. *Carinella annulata* (Montagu) Mac Intosh.

Synon. Carinella trilineata Johnston.
Polia crucigera delle Chiaje.
Valencinia ornata de Quatrefages.
Nemertes superbus Kölliker.
Siphonenteron elegans Renier.
Tubulanus elegans „

This species is not rare in Naples. Its ground colour varies from a light van Dyck brown to dark chocolate brown. The average of specimens has four longitudinal white lines running along the middle of the back, belly and sides and intersecting the numerous white rings. In several other specimens only the white rings were present,

whereas a few specimens — perhaps in coincidence with the spawning season — had turned to a light yellowish fawn colour. The proboscis is furnished with urticating organs.

4. *Carinella polymorpha* (Renier) Hubr.
Synon. Valencinia splendida Quatref.
Tubulanus polymorphus Renier.

Differing from the foregoing species by the form of the head which is still wider and more hammershaped as well as by the colour, which is always a uniform reddish or orange brown. In spirits the part of the body posterior to the oesophagus generally presents a darker colour than the anterior part.

Familia *Valenciniaidae* mihi.

Nerves just within the muscles of the body-wall, separated from the epiderm by only a thin layer. No cephalic furrows or fissures, but a small opening an each side of the head leading by a ciliated duct into the posterior lobe of the ganglion.

Genus *Valencinia* Quatrefages. The opening for the proboscis far behind the tip of the snout.

5. *Valencinia longirostris* Quatrefages.
Synon. Valencinia lineformis Mac Int.

Colour white with a roseate hue, which is occasionally stronger anteriorly. No eyes in the specimens I had occasion to examine. Head pointed, though rarely so much as in Quatrefages' figure of the species. Specimens at Naples did not exceed 1 dm. in length. They were generally coiled together in knots, though not very long themselves.

Family *Poliaidae* mihi.

Lateral nerves within the muscles of the body wall. A pair of posterior lobes to the ganglion are coalesced with the inner and hinder surface of the superior lobes.

Genus *Polia* delle Chiaje. Head separated from the body, by a very faint constriction and rounded anteriorly as in *Carinella*. The posterior lobes of the ganglia communicate by means of ciliated canals with two transverse cephalic grooves which do not meet on the dorsum but carry numerous short parallel grooves, perpendicular to the first. Eyes with lenses. Two longitudinal nerve-trunks in the proboscis.

6. *Polia delineata* delle Chiaje.

Synon. Baseodiscus delineatus Diesing.

This species attains to a considerable length, always remaining comparatively thin. Dark brown stripes longitudinally intersecting the light brown ground colour are present ventrally as well as dorsally, even in the youngest stages. About five to seven may be counted in a transverse line across the back. The mouth is small and is situated immediately behind the ganglion. The posterior lobe of the ganglion is characterized by a special greenish hue. Up to twenty-three eyes were counted on each side of the head. Proboscis very thin. Next to *Cerebratulus marginatus* and *Amphiporus pulcher* this is the most common species in Naples.

7. *Polia curta* n. sp.

Distinguished from the foregoing by its greater width in comparison to its length. The brown stripes are much more closely set on the back, 12—15 being counted in a transverse line on the back. The belly remains white; only in the very largest examples it becomes striped too, the region of the mouth and undersurface of the head always excepted. In very young examples the stripes are yet stellate pigmentspecks, whereas at the same age they are stripes already in *Polia delineata*. Eyes, ganglion and cephalic grooves as in this species.

8. *Polia minor* n. sp.

This interesting species has on superficial inspection a

very strong resemblance with true representatives of the genus *Amphiporus*, hereafter to be described. It is comparatively short and stout, the single specimen I obtained measuring 15 mm. in length and 4 to 5 mm. in width. The eyes are exceedingly numerous; there are at least 80 on either side of the head. The proboscis seems to be wider in the middle than at the two ends; neither the proboscis nor the proboscidian chamber occupy the whole length of the body. In the tail it appears (on compression of the animal) that the lateral nerves of both sides meet, the commissure being situated *above* the anus. The colour is a yellowish grey, merging into a reddish orange anteriorly; the sides of the body seem to be more or less transparent.

Subordo II. SCHIZONEMERTINI mihi.

A deep longitudinal lateral fissure on each side of the head, from the bottom of which a ciliated duct leads into the posterior lobe of the ganglion. Lateral nerves between the longitudinal and inner circular muscular coat of the body-wall. Nervous tissue deeply tinged with haemoglobine. Mouth behind the ganglia.

Familia *Lineidae* Mac Intosh.

Body more or less flattened. Nerve trunks situated quite laterally, diametrically opposite.

Genus *Lineus* Sowerby. Body extremely long in comparison to its width. Eyes very numerous.

No species belonging to this genus were found at Naples; three species are known from the Atlantic: *Lineus longissimus* (Gunn) Sowerby, *Lineus obscurus* Desor (Mac Intosh makes the two species ont of it: *Lineus gesserensis* and *Lineus sanguineus*) and *Lineus lacteus* (Montagu) Mac Intosh.

Genus *Borlasia* Oken. Body round and massive, not

tapered posteriorly. Proboscis extremely slender. The thick muscular coats of the body-wall are tinged red.

9. *Borlasia elizabethae* Mac Intosh.
Synon.? Ophiocephalus murenoides delle Chiaje.

No eyes, body hardly flattened dorso-ventrally, generally with numerous wrinkles on the surface. I found specimens in which the head was white and speckled with green as described by Mac Intosh, others in which it was of the same purplish brown colour of the body. The white cross-belts were sometimes distinct, sometimes very faint indeed. Urticating elements in the proboscis.

Genus *Cerebratulus* Renier.

Body more or less flattened. Proboscis generally with a cross of fibres at each pole in transverse section. Eyes not very developed, rarely numerous. Urticating elements of different size in the wall of the proboscis. In several species four longitudinal nerve trunks in the proboscis. In others there is a very delicate caudal appendage.

10. *Cerebratulus marginatus* Renier.
Synon.? Fasciola angulata O. F. Müller.
Serpentaria fragilis Goodsir.
Meckelia somatotomus Leuckart.
Polia siphunculus delle Chiaje.
Cerebratulus angulatus Mac Intosh.
» grandis (Sars) O. Jensen.
Lineus beattiaei Gray.
Meckelia olivacea Rathke.

This is in Naples the most common species and can attain considerable dimensions. A spirit-specimen is in my possession in which the width of the body close to the tail measures 30 mm. In colour it varies from a whitish grey or brown to a dark steelblue. There is no difference in

the coloration of back and belly; it is uniform all over. The margins of the body are white, so are the margins of the cephalic fissures. Exceptionnally the white margins may sometimes disappear (*Pl. angulata* O. F. M.). No eyes. An anal papilla was observed in most of the specimens, in some of which it seemed even to have become a short caudal appendage. This species was first described by Renier. Blainville afterwards created a confusion by figuring this species under the name of *C. bilineatus*, which had been employed by Renier for quite a distinct species as will be noticed further down. Delle Chiaje did not correct Blainville's error and moreover brought these two species together with Renier's *Tubulanus* (a true *Carinella*) in his genus *Ophiocephalus*, the third species of which was *O. murenoides* (probably identical with Mac Intosh's *Borlasia elizabethae*). *C. marginatus* seems to extend from Norway to the Mediterranean.

11. *Cerebratulus pantherinus* n. sp.

This species may on a superficial inspection be easily confounded with the foregoing by its colour and the two white lines alongside of the body margins. Still I found it to differ constantly in no unimportant points: internally, by the red colour of the nervous tissue which was constantly much paler than in *C. marginatus* or in any other species of the same genus (less haemoglobine contained in the nervous tissue); externally by the spotted or marbled character which the brownish grey ground-colour affects on the head and the anterior portion of the trunk. The belly is generally of a lighter colour than the back. The margins of the respiratory fissures are never white as in *C. marginatus*, at the same time they seem to be shorter than in this species and the head more truncated. Finally there was a marked difference in the physiological sensitiveness of the two species towards desoxygenated seawater. One specimen entirely devoid of pigment, was of a uniform pale yellow.

12. *Cerebratulus bilineatus* Renier.
Synon. Lineus bilineatus Mac Intosh.
(nec Polia bilineata delle Chiaje!)
Cerebratula oerstedii van Beneden.
Cerebratulus taenia Mac Intosh.
» bivittatus Ulianin.

Renier has given a very fair description of this species which, as mentioned above, was confused with another species by Blainville and delle Chiaje. This has again induced Mac Intosh into error, who was the first to find this species on the British coast and who felt justified in identifying it with another of delle Chiaje's species which (curiously enough) bears the same specific name of *Polia bilineata*. Delle Chiaje's last named species is however quite different from the true *C. bilineatus* as described by Renier and figured by Mac Intosh (Plate VI, fig. 1) and will be noticed in its turn. We may remark that delle Chiaje himself never identified his species with the one described by Renier.

I have little to add to Mac Intosh's description; at Naples the specimens were generally pinkish. In examining very small specimens with the microscope the two dorsal white lines, being less transparent, appear darker than the ground-colour.

13. *Cerebratulus dellechiajei* Hubr.
Synon. Polia bilineata delle Chiaje.
(nec Lineus bilineatus Mac Int.!)

This species is quite different from the foregoing and seems not to be rare in the neighbourhood of Capri. Delle Chiaje's figure (Pl. 103) gives a very fair representation of it, the dark greenish or purplish ground-colour being intersected by one very thin white line in the median line of the dorsum and two broad ones to the right and left of it. These are continued on the head; the belly is of a uniform

dark grey, the margins of the body are generally marked off by two other white lines. A small caudal appendage similar to that of other species which have formerly been united in the genus *Micrura* is present in most of the specimens. The deep red colour of the ganglion shines through the pigmented tissues of the head. The urticating elements in the proboscis are of different dimensions; the smaller ones measure 0.018 mm. without thread, the larger ones up to 0.075 mm. Eye-specks very numerous in four series, close to the lateral margin of the head, two of them on the ventral, two on the dorsal lips of the respiratory fissures. In each series I counted from 12—30 eyes, the number differing according to the size of the specimen. There is a considerable amount of variation in the intensity of the ground-colour which in some has become so dark that the white lines on the back have almost totally disappeared, after having passed through a reddish tinge, and that only the tip and sides of the head are whitish yet. The belly is very dark too in these specimens, whereas in others it is white or nearly so, and in that case the coloured stripes on the back have faded down to a light sienna.

14. *Cerebratulus liguricus* (Blanchard) Hubr.
Nemertes ligurica Blanchard. (Ann. des Sc. Nat. XII. ser. 3.)

By its general appearance this species may be easily taken for *C. marginatus*. The colour is a light grey with whitish margins. Contrary to what is found in the latter species, this Nemertean has eyespecks, about 12 on each side of the head. In specimens which are preserved entire a small translucent caudal appendage, capable of a certain lengthening and shortening is often, though not always, visible. In most of the specimens an extremely fine transverse wrinkling of the skin seems to be a characteristic feature.

15. *Cerebratulus dohrnii* n. sp.

To this species I refer several specimens from the bay of Naples of no very considerable size but very gracefully coloured. The four margins of the cephalic fissures are marked off by thin brown streaks. Another brown streak along the middle of the back is more sharply defined on the head than farther backward. The ground-colour seems to be pale yellowish; to the right and left of the median dorsal line there are two white longitudinal bands which in their turn are bordered by two light brown ones occupying the body margins. Near the tip of the snout there are about three eyes on each side. Although there is a certain resemblance between this species and *C. bilineatus* Renier they cannot be confounded when examined in the fresh state. The largest specimens measured when extended 4 cm. in length and $1^1/_2$ mm. in width.

16. *Cerebratulus purpureus* (Dalyell) Hubr.

Synon. Gordius purpureus spinifer Dalyell.
Micrura purpurea J. Müller.
Cerebratulus flavifrons Grube.
Micrura purpurea Mac Intosh.

This species was not uncommon at Naples although I never saw specimens of considerable size. The colour was of a dark blackish purple; the white patch on the tip of the snout seems to contain, when examined with the microscope, two sets of pigment-grains. Eyes could not be detected. The mouth is of moderate dimensions. There is a thin caudal appendage on the posterior extremity of the body. Dimensions of urticating elements in the proboscis rather considerable (0.133 mm. with, 0.037 mm. without the thread).

17. *Cerebratulus grubei.* n. sp.

Of this new species I was able to examine three spe-

cimens caught at different times and in different localities. They resemble the foregoing species at first sight, especially by the colour. On closer inspection they proved to be distinguished by the fact that the tip of the snout is not white but black and that a very thin white transverse ring makes its appearance immediately behind the tip of the snout. Grube has already found this worm in the Adriatic (Die Insel Lussin, Breslau, 1864, page 96) without however describing it as a distinct species. In captivity the dark glossy colour of one of these animals changed to a dirty light brown. In length they did not exceed 14 mm. I was unable to detect a caudal appendage. The mouth is moderate.

18. *Cerebratulus tristis* n. sp.

Two specimens were procured of this species which has again by its dark purple coloration strong resemblance to the two foregoing. The snout seems to be rather pointed, more so than in the two latter species; the coloration is uniform all over the body; the cephalic fissures are long and deep; the mouth is exceedingly small. Urticating elements were found in the proboscis, different in some respects from those in the two foregoing species (the larger ones only measured 0.011 mm. without thread).

19. *Cerebratulus geniculatus* (delle Ch.) Quatrefages.
Synon. Notospermus drepanensis Huschke.
Notogymnus » Ehrenb.
Meckelia annulata Grube.
Polia geniculata delle Chiaje.
(nec C. geniculatus Grube!)

Of this species only one very young specimen was brought, having the usual green colour; two others belonged to a curious dark purple variety. The white rings round the body were identical, the front one showed the characteristic

triangle pointing forwards, which is already figured by Huschke. This species seems to be more compressed than others of its congeners. I failed to detect any caudal appendage. The proboscis contains urticating elements (0.036 mm. without thread).

20. *Cerebratulus hepaticus* n. sp.

Under this name I wish to describe a species which is represented in Naples by numerous specimens, often attaining a considerable size (up to 8 or 10 mm. in width). The ground colour which is subject to much variation is generally a mixture of grey, red and brown; the hinder part of the body is generally distinguished from the anterior portion by its brick red colour, which is due by transparency to the coloured cells in the wall of the intestine. The proboscis when protruding is transversely banded with brown in the portion which is nearest the head. The tip of the snout is yellow; the anterior parts of the back and throat are often marked by a few light green or yellowish patches, irregularly distributed. The respiratory fissures on both sides of the head are very long, so is the head itself. In fresh specimens with uninjured tails a small caudal appendage which did not seem capable of much extension was sometimes noticed. The proboscis is provided with urticating elements (rarely longer than 0.013 mm., thread not included).

21. *Cerebratulus urticans* (J. Müller) Hubr.
Synon. Cnidon urticans J. Müll.
Meckelia » »

The average size of the specimens belonging to this species was 2 or 3 dm. in length and 8 or 10 mm. in breadth. They are characterized by the proboscidean sheath bulging out in the median line of the dorsum, especially in the posterior half of the body, where transverse constrictions

may moreover contribute to give it a moniliform appearance. The fluid in this proboscidian cavity has a deep red tinge which shines through the walls of the body and which is due to haemoglobin contained in the corpuscles with which this fluid is laden. The colour of the specimens may vary from a vinous flesh colour to a dark bluish red. Three short, dark, paralel, longitudinal stripes are present on the top of the head towards the tip of the snout. This species has a short caudal appendage. Urticating elements in the proboscis of the most different dimensions yet very regularly distributed over the surface, the largest (0.132 mm. long with a thread of about twice that length) being situated on two longitudinal ridges along the whole length of the proboscis. Eyes seldom visible; in one specimen I noticed during compression and after having added acetic acid six to eight very small pigment-specks close to the margin of the body and the tip of the snout.

22. *Cerebratulus roseus* (delle Chiaje) Hubr.
Synon. Polia rosea delle Ch.

It is very probable that delle Chiaje's *Polia rosea* was established on specimens of the species about to be described. There is a general resemblance to *C. urticans*. The colour is generally a light flesh colour or faint vermilion, intermixed with yellow in the posterior pars of the body where the intestine shines through the integuments. The head is more or less flat and pointed and generally yellowish too. Only once I met with an olive green variety which in a few days had changed its colour to a reddish tinge. A caudal appendage is present in perfect individuals and was observed to attain a not inconsiderable length in some cases. The portion of the trunk which forms the oesophageal region is generally more cylindrical, posteriorly the body becomes flattened.

The principal difference from *C. urticans* is the greatly diminished size of the urticating elements in the proboscis.

There are no longitudinal dark streaks on the head, nor could I discern any eyes.

23. *Cerebratulus fuscus* (Mac Intosh) Hubr.
Synon. Micrura fusca Mac Intosh.

The representatives of this species in Naples do not seem to attain a considerable length. They generally measured from 3 to 5 cm. On the yellow ground-colour the minute brown dots and specks are much more numerous and better visible than would appear from Mac Intosh's figure. A caudal appendage is present.

24. *Cerebratulus aurantiacus* (Grube) Hubr.
Synon. Meckelia aurantiaca Grube.
Micrura aurantiaca Mac Intosh.
Cerebratulus croceus Grube.

Bright orange with a white transverse band behind the tip of the snout. No specimens were examined exceeding 7 cm. in length. Tip of the snout truncated as in *Cerebratulus purpureus* Urticating elements observed in the proboscis, which only measured from 0.007 to 0.009 mm. (exclusive of thread).

25. *Cerebratulus lacteus* (Grube) Hubr.
Synon. Nemertes lactea Grube.
» » Ulianin.

White or yellow, generally with curious transverse wrinkles, which give the animal a different aspect from other Nemerteans. The pigment of the integument becomes detached very easily and then takes the appearance (under the microscope) of feathered stripes. A caudal appendage is present. The eyes which were noticed by Grube seem to be absent in the majority; I saw them only in a couple

of specimens and in a smaller number than Grube indicates. In the yellow variety the red ganglion is very well visible through the integument; better so than in the white. The urticating elements in the proboscis measure about 0.006 to 0.007 mm. (thread excluded).

26. *Cerebratulus fasciolatus* (Ehrenberg) Hubr.
Synon. Micrura fasciolata Ehrenberg.
Cerebratulus geniculatus Grube.
Meckelia knerii Diesing.
Cerebratulus geniculatus Ulianin.

Dark greenish with white rings at regular intervals. Anterior part of the head white with a small number of eye-specks. The red variety figured by Mac Intosh was not noticed at Naples. A caudal appendage was never wanting; a small specimen of 20 mm. carried ripe eggs already, and so the question arises whether perhaps at Naples this species ever attains the size it does in the Atlantic.

Familia *Langiaidae* mihi.

The margins of the body are slightly frilled and lapped up over the back, which takes the aspect of a partly closed tube from the head to the tail. Internally the nerve-trunks lie more above the intestine than beside it.

Genus *Langia* nov. gen. Characters as in the family; the openings of the watervascular system are situated dorsally, in the hollow space enclosed between the upturned body margins.

27. *Langia formosa* n. sp.

Belly of a pale vermilion, margins of the body whitish, back posteriorly yellowish. Especially in the anterior part of the trunk the upturned, frilled body margins have thick borders, posteriorly they diverge now and then, showing the yellow colour of the intestine shining through the

integument of the back. Immediately behind the respiratory fissures the body margins close together dorsally. Along the bottom of this dorsal furrow the proboscidian canal often protrudes as a rounded longitudinal ridge.

After immersion in spirit the head appears as if separated from the body by a shallow groove, much less pronounced in life. The tip of the tail has often a very pointed appearance.

Subordo HOPLONEMERTINI mihi.

One or more stylets in the proboscis. Mouth generally situated before the ganglia. Lateral nerves inside the muscular coats of the body wall. No deep longitudinal fissures on each side of the head.

Familia *Amphiporidae* Mac Intosh.

Body when extended comparatively short and wide. The proboscis which is easily and repeatedly extruded is thick in the extensile part and covered with large adhesive papillae. Numerous longitudinal nerves in the proboscis. A transverse respiratory furrow on the head, generally with short perpendicular furrows as in *Polia*. A ciliated duct from the posterior ganglionic lobe to this furrow.

Genus *Amphiporus* Ehrenberg.

A single central stylet in the proboscis with two or more accessory styliferous vesicles. No accessory membranaceous sacs in communication with the proboscidian cavity. Numerous, well developed eyes.

28. *Amphiporus pulcher* (Johnst.) Mac Intosh.

Synon. Planaria rosea O. F. M.
Nemertes pulchra Johnst.
Vermiculus rubens Dalyell.
? Amphiporus albicans Ehrenberg (from the Red Sea).

A common species at Naples varying in colour from vermilion to yellow in all the intermediate paler and intenser shades. No specimen was met with which was longer than 3 cm. Proboscis and cephalic grooves as described by Mac Intosh. Posterior ganglionic lobe pyriform, connected by commissures with the upper anterior lobe. External opening of the ciliated duct (which is longer than in *Drepanophorus*) before the ganglion.

29. *Amphiporus lactifloreus* (Johnston) Mac Intosh.
Synon. Polia mandilla Quatrefages.
» mutabilis »
» violacea »
» berea »
» glauca »
Borlasia mandilla Keferstein.
Gordius albicans Dalyell.
Polystemma adriaticum Ehrenberg.
Cephalotrix armata (!) Uljanin.

Compared with *A. pulcher* it is always much longer and less wide. The white specimens seem to be more numerous at Naples than those with reddish or pink tints. The eyes seem to be less developed than in *A. pulcher*, the hemispherical refracting portion not so constantly present. The situation of those portions of the ganglia which communicate with the exterior by the ciliated duct is moreover different from what it is in *A. pulcher*. They are situated *before* the cerebral lobes instead of behind them and connected with them by commissures.

30. *Amphiporus dubius* n. sp.

Three specimens were examined, all agreeing in the following characters. Ground-colour a yellowish brown with very small equidistant darker grains. At first sight four eyes appear to be present which however show to be four groups of eyes containing 2 or 3 eyes each. A re-

fractory hemisphere is present in each of the eyes. Respiratory lobes neither before nor behind the cerebral ganglion but on a level with it. Ciliated canal rather short. Stylet truncated behind, very much resembling that of *Oerstedia vittata* which will be described further on. The transverse respiratory groove runs between the anterior and posterior group of eyes; the latter group seems to be situated above the respiratory lobe of the ganglion.

31. *Amphiporus marmoratus* n. sp.

Synon.?? Cosmocephala cordiceps (Sars) Jensen.

The form of the stylet in the proboscis, the colour and the presence of a longitudinal groove on the head are the differences which separate this species from the foregoing. The handle to the central stylet is posteriorly provided with two short, winglike appendages, probably in accordance with the insertion of muscles. These two wings are not always easily visible, they often give to the basis of the stylet, when viewed sideways, a crooked or bent appearance.

The colour in young specimens is a dark rufous brown, which in larger specimens becomes marbled with darker. The number and disposition of the eyes is very similar to what is found in *A. pulcher*. The longitudinal furrow mentioned above is not deep but provided with a series of longer hairs besides the ordinary cilia. It seems to be double, or at least provided with a median protruding ridge. Ventrally it commences before the mouth, passes across the tip of the snout on to the back, where is can be traced a good way behind the transverse respiratory furrows.

I am greatly inclined to think that the specimen described by Jensen and Sars under the name of *Cosmocephala cordiceps* belongs to this species. If once a more detailed anatomical investigation will have shown the atlantic and mediterranean species to be identical, the genus *Cosmocephala* must again disappear from among the European Nemerteans. As it is, Sars' description does not allow of the immediate identification of the two species.

32. *Amphiporus hastatus* Mac Intosh.

This species is not common at Naples. In six months I received only one specimen, which corresponded to the description given by Mac Intosh. I have only to add that neither the proboscis nor the proboscidian sheath extend as far as the posterior part of the body, such as it is the case in the other Amphipori; that the two lateral nerves merge into one in the tail by a commissure situated *above* the intestine, and that the mouth and the opening for the proboscis seem to have coalesced in one opening which is situated ventrally, near the tip of the snout. All these and some other points by which they show to differ from the other species of *Amphiporus* will perhaps necessitate, after a more detailed study of their anatomy, the establishment of a separate genus for this species and the following. There is a certain probability that Grube established his genus *Akrostomum* on a spirit-specimen of this species, in which case his generic name might be re-established and more closely defined. However provisionally I propose to leave them with the Amphipori.

33. *Amphiporus pugnax* n. sp.

Different from the former by having no fewer than seven accessory styliferous vesicles in the proboscis and a differently shaped central stylet as well.

The colour is a pale vermilion, gradually merging into a greyish white. The body is not flattened but cylindrical as in the foregoing species. Two small eyes seem to be present near the tip of the snout as in *A. bioculatus* Mac Intosh. Mouth serving at the same time as opening for the proboscis. Externally a small lateral opening is visible. A cephalic furrow was not clearly made out.

Genus *Drepanophorus* Hubrecht. Proboscis provided with a crooked plate upon which a series of small stylets is attached. Numerous lateral vesicles with accessory stylets in the surrounding tissue. The cavity of the proboscidian sheath communicates with a series of membranaceous sacs regularly placed to the right and left, which serve as temporary reservoirs for the proboscidian fluid. Numerous eyes.

34. *Drepanophorus rubrostriatus* Hubrecht.

Synon. Cerebratulus spectabilis Quatrefages.
Amphiporus » Mac Intosh (pro. p.).
(nec. Borlasia splendida Keferstein!)
Drepanophorus spectabilis Barrois.

Although Quatrefages' specific name has the priority over mine for this species I must persist in using the name of *rubrostriatus* after the confusion which has been created by Mac Intosh in his later publications (On *Amphiporus spectabilis*, Quart. Journ. for Micr. Sc. n°. LIX) with regard to the original specific designation. In his monograph he applies Quatrefages' name of *C. spectabilis* to quite a different species of *Amphiporus* from the Atlantic, described by Keferstein under the name of *Borlasia splendida*. This identification is principally based upon the striking resemblance which the two species present in their system of coloration. In the more recent paper mentioned above he persists in this error, and after having examined a specimen of the true *spectabilis* (sent to him by myself) he moreover regards the anatomical results of his investigation of this latter specimen as applying to the specimens he formerly examined (of *A. splendidus* Keferstein!) in this way confounding specimens, species and even genera! Barrois has clearly shown this in his »Embryologie des Nemertes" (p. 137). In order to avoid further confusion the specific name of *spectabilis* will have to be dropped, the atlantic species must henceforth be called *Amphiporus*

splendidus (Keferstein) Barrois and the mediterranen one *Drepanophorus rubrostriatus* Hubr.

The five parallel red lines on the back were present in the very youngest stages observed (2 mm.); the number of eyes increases with age. The largest specimen measured 6 cm.

35. *Drepanophorus serraticollis* Hubrecht.

Synon. Drepanophorus nisidensis Hubrecht.

?? Cerebratulus crassus Quatrefages.

Distinct from the former by its system of coloration and probably by an augmentation (in stages of a corresponding age) of the number of small grooves which are perpendicular to the transverse respiratory groove.

The back is yellow (in a very rare variety this becomes dark brown) the margins of the body are white or pinkish. A thin whitish patch divides the yellow colour of the back from the vinous red mixed with yellow which is characteristic for the head. Two specimens attained the considerable length of 12 cm. with a width of 10—12 mm. In this species as in the former the external opening of the ciliated duct, leading into the rounded posterior ganglionic lobe, is situated behind or on a level with the ganglion. The duct itself is short.

I doubt whether Quatrefages' *C. crassus* had an unarmed proboscis as he positively describes it to have had. There is great probability of his specimen having either belonged to this species or to *Amphiporus pulcher*.

Familia *Tetrastemmidae*.

Eyes four. Respiratory grooves not branched. Respiratory lobe of the ganglion apparently in regressive metamorphosis.

Genus *Tetrastemma* Ehrenberg. Generally of small size, body capable of considerable lengthening and shortening. Eyes generally small in comparison to the width of the body.

36. *Tetrastemma dorsalis* Abildgaard.

Synon. Tetrastemma fuscum Oersted.
» variegatum Leuckart.
» marmoratum Claparède.

Is present at Naples in several varieties: with a dorsal median line, marbled on the back, of a uniform dark colour, etc. I have nothing to add to the descriptions of previous authors.

37. *Tetrastemma flavidum* Ehrenberg.

Synon. Polia sanguirubra Quatref.
» obscura v. Beneden.
Tetrastemma varicolor Mac Intosh.

Only a few specimens of this species, so well characterized by the considerable distance between the anterior and posterior pair of eyes, have come under examination.

38. *Tetrastemma candidum* (O. F. Müll.) Oersted.

Synon. Polia quadrioculata Quatref.
Tetrastemma varicolor Oersted (pro p.).
» algae Leuck.

The Naples representative of this species is rather common and generally of a bright green colour. Other varieties are more yellowish. For further details I refer to Mac Intosh's description.

39. *Tetrastemma vermiculatum* (Quatref.) Mac Int.

Synon. Polia vermiculata Quatref.

The longitudinal dark bands between the two eyes on each side render this species easily recognizable and by their constancy prove the specific distinction to be well founded.

Provisionally I aur in clined to regard as a variety of this species, several specimens I received in which a white

patch (black by transparency) occurs in front between the two lines uniting the eyes. May be that it afterwards shall turn out to be specifically distinct.

40. *Tetrastemma melanocephalum* (Johnst.) Dies.
Synon. Ommatoplea melanocephala Mac Int.

The yellow colour and the broad blackish-brown patch on the head are characteristic for this species. It must however be kept distinct from *T. coronata* with which Mac Intosh held it to be identical; in Naples both species occur and by the absence of any intermediate variety must be regarded as distinct species.

41. *Tetrastemma coronatum* (Quatref.) Hubr.
Synon. Polia coronata Quatrefages.

A dark band, less broad than in *T. melanocephala* is situated transversely between the anterior and posterior pair of eyes. It is sometimes interrupted in the middle and always readily distinguished from the dark patch which is characteristic for the foregoing species. The colour is never so decidedly yellow as in *T. melanocephala*. Numerous specimens confirmed the necessity of distinguishing them.

42. *Tetrastemma diadema* n. sp.

Two white patches on the head (black when viewed by transparency under the microscope) not due to a separate pigment but to fatty globules in the integument. They are very constant in form and dimensions; one is large and quadrangular and reaches from the front pair of eyes to near the hinder pair, whereas the other smaller one is situated behind the posterior eyes. Generally two smaller patches of the same nature occur towards the lateral margins of the head, whereas a transverse band of lightbrown pigment runs across the head and unites the two posterior eyes.

Numerous specimens proved this to be a reliable species,

not passing by degrees of variation into any of the species before described.

43. *Tetrastemma octopunctatum* n. sp.

Easily recognizable by eight round dark brown blotches placed along the median line of the back at about equal intervals from each other, on the green ground colour of the body. The diameter of each blotch is about equal to one fifth of the width of the body.

The shape of the central stylet differs from that of *T. dorsalis*, the point is very long and so are the reserve stylets. Several specimens, all differing by the same character, have come under my notice at different times and have given me the conviction of the specific distinction of this form.

Genus *Oerstedia* Quatrefages (Char. emend.). Four eyes, large and well developed as in Amphiporus. Body short and stout; more so than in Tetrastemma. Respiratory lobe of the ganglion in front of the superior lobe with which it is in close connection.

I have employed this generic name for two species about to be described, although I did not succeed in finding the species which Quatrefages established this genus on, and although Mac Intosh regards these two species as identical with Tetr. dorsalis. I am not prepared either to invalidate or to confirm this identification but prefer using Quatrefages' name rather than establishing a new generic division for species which are at all events nearly related to Quatrefages' original specimens. However I do not think the sublateral position of the nerve-trunks as important a generic character as does the french naturalist.

44. *Oerstedia vittata* n. sp.

Four large eyes with anterior refracting hemispheres placed in a quadrangle. Belly and back yellowish white. Four longitudinal parallel brown bands running along the back are confluent behind the transverse respiratory grooves in two quadrangular patches which send out two thin brown lines towards the head passing between the posterior pair of eyes.

The handle of the central stylet in the proboscis is abrubtly truncated behind and thins off anteriorly. Two styliferous vesicles each of them with two accessory stylets were observed. Corpuscles of the proboscidian fluid apparently bacillary.

45. *Oerstedia unicolor* n. sp.

Eyes as in the foregoing species. Ground colour a uniform brown which, microscopically examined, seems to consist of an exceedingly fine meshwork. A white transverse band across the tip of the snout. Another on a level with the posterior pair of eyes. These eyes are connected by a transverse band of dark pigment. Handle of the stylet not truncated; resembling that of *Amphiporus* and *Tetrastemma.*

Familia *Nemertidae* Mac Intosh.

Body long and coiled, eyes generally numerous, smaller and less developed than in the Amphiporidae.

Genus *Nemertes* Cuv. (char. emend.). Posterior part of the proboscis comparatively short. Proboscis very seldom extruded.

46. *Nemertes gracilis* Johnston.
Synon. Nemertes balmea Quatref.

Numerous in Naples. Easily recognized by the characteristic stylet-handle and long accessory stylets. All different colour-varieties between yellowish, grey, green and blue came under observation. The species has a great hardihood in confinement.

47. *Nemertes echinoderma* (Marion) Hubr.
Synon. Borlasia echinoderma Marion.

This species is immediately characterized by the curious corpuscles imbedded in the epiderm which have the form of bent transparent hooks, pointed as both ends. The handle of the stylet is abruptly truncated posteriorly. Eyespecks

numerous, some of them placed far back, over the lateral nerve-trunks from which they are innervated.

A great extent of colour variation prevails in this species. The extremes were represented by a dark olive, a bright brick-red and an orange specimen which come under observation at different occasions.

48. *Nemertes antonina* (Quatref.) Hubr.
Synon. Polia antonina Quatrefages.

Characterized by its extreme tenuity which gives it quite a threadlike appearance. Its uniform light carmine colour is another peculiarity by which it is easily recognizable. The proboscis is thin in accordance with the rest of the animal, the central stylet is rather weak and seems not unfrequently to be missing; the ganglionic lobes of both sides are united by a broader commissure than in any other species of Nemertean.

49. *Nemertes marioni* n. sp.

Basis of the central stylet spindle shaped, long and thinned towards both ends. In external habitat, colour etc. it resembles *Amphip. lactifloreus*. Here too the ventral commissure of the ganglia is of considerable thickness. There are 13 to 15 small pigmented eyespecks on each side of the head, many of them curiously indefinite of contours.

50. *Nemertes neesii* (Oersted) Mac Intosh.

One specimen was observed which unluckily got mislaid before further examination was possible. However the characteristic longitudinal brown lines on the anterior part of the trunk etc. render it almost certain that this species is an inhabitant of the Mediterranean, though certainly rare at Naples.

The species which have here been provisionally described, will ere long be more circumstantially treated of in a

monograph on the same subject, in which I will be enabled, through the liberal succour of the energetic foundator of the zoological station at Naples, Prof. Anton Dohrn, to give coloured figures of the different species and numerous illustrations of anatomical details. The splendid example given by the Ray Society in publishing Dr. Mac Intosh's coloured figures of Nemerteans has at the same time shown how it is possible only in this way to avoid and gradually to clear away the endless confusion which has hitherto prevailed in the definition and nomenclature of these worms, which are so difficult to recognize by external features. Mac Intosh himself has contributed considerably to clear up this confusion by his extensive knowledge of the literature of the subject and by his careful and exhausting treatment of the synonymy. Jensen's figures too are very fair and henceforth it will be necessary to figure every species that is described as new.

Finally I subjoin a list of those European species which I regard as well characterized but which I did not obtain from the Bay of Naples. They are:

Prosorhochmus claparedii Kef., *Tetrastemma kefersteini* (Mar.) Hubr., *Tetrastemma hermaphroditica* (Kef.) Hubr., *Lineus longissimus* (Gunn.) Sow., *Lineus obscurus* Desor, *Amphiporus splendidus* (Kef.) Barr., *Nemertes carcinophila* Köll.

With the fifty species mentioned in the foregoing pages this makes the total of European species of Nemerteans amount to fifty-seven.

For certain contributions to the anatomy of the group I refer to a preliminary account in the «Zoologischer Anzeiger, 8 Sept. 1879» which will ere long be followed by a more elaborate account of the investigations I had occasion to make during my stay at Naples.